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**APPLICATION FOR UNITED STATES
LETTERS PATENT**

**ROTATING SHEARING DEVICE AND METHOD FOR SEPARATING THE FRONT
CROP AND REAR CROP FROM RUNNING ROLLING STOCK**

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BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to a rotating shearing device for cropping fast-running rolling stock and a method for separating the front crop and the rear crop from the running rolling stock by a shearing device.

2. Description of the Related Art

A rotating shearing device of the generic type is disclosed in U.S. Patent No. 3,491,640.

A further shearing device of this type is shown in DE-A 24 35 486, which also shows the conventional overall plant which consists of two shearing devices arranged one behind the other. The front crop is separated from the rolling stock by the front or first shearing device. After the rolling stock is run through, the rear crop is then separated by the second shearing device. Each of the guides arranged in front of the shearing devices is mounted pivotably, that is to say the end of the guide facing the shearing device is capable of being raised and lowered in relation to the respective fixedly arranged shearing device. The rolling stock can therefore be brought into the cutting range of the annular knives, for this purpose the guide arranged in front of the shearing device being pivoted upward.

Fixedly positioned guides are provided behind the shearing devices for receiving the front crop and rear crop, respectively.

The necessary use of two shearing devices, with all the associated guides, drives and controls, gives rise to very high plant costs which then, of course, also entail high operating and maintenance costs. Furthermore, these plants require a large amount of space.

SUMMARY OF THE INVENTION

The object of the present invention is to provide a shearing device and method for separating the front crop and rear crop with reduced costs and reduced space requirements.

The object of the present invention is achieved by a rotating shearing device for
5 cropping fast-running rolling stock, in particular wire, with two axially cutting annular knives which rotate about their axis at the same rotational speed with end cutting edges directed toward one another. The cutting edges converge to the clearance necessary for separating the rolling stock during a cutting operation and lie in planes which are arranged at an acute angle to one another. Rolling stock is guided to the shearing device by a front guide and from the shearing
10 device by a rear guide. The running stock may be guided either through the space between the annular knives which is free for the cut-free passage of the rolling stock or into the wedge-shaped cutting region of the annular knives which is defined by the gripping angle. The front guide is pivotable, the rear guide is fixed and the shearing device is raisable and lowerable in relation to the rear guide.

15 According to the invention, only one shearing device is used which separates both the front crop and the rear crop. Which part is separated and correspondingly conveyed away determines the interaction of the guide part arranged in front of the shearing device and behind the shearing device with the shearing device or the respective position of the annular knives in relation to one another.

20 Other objects and features of the present invention will become apparent from the following detailed description considered in conjunction with the accompanying drawings. It is to be understood, however, that the drawings are designed solely for purposes of

illustration and not as a definition of the limits of the invention, for which reference should be made to the appended claims. It should be further understood that the drawings are not necessarily drawn to scale and that, unless otherwise indicated, they are merely intended to conceptually illustrate the structures and procedures described herein.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, wherein like reference characters denote similar elements throughout the several views:

Fig. 1 is a schematic view of a shearing device according to the present invention
5 with a front guide that is in a lower position and annular knives that are in a basic position;

Fig. 2 is a schematic view of the shearing device of Fig. 1 with the front guide in a middle position and the annular knives in the basic position;

Fig. 3 is a schematic view of the shearing device of Fig. 1 with the front guide in the middle position and the annular knives in a high position; and

10 Fig. 4 is a schematic view of the shearing device of Fig. 1 with the front guide in an upper position and the annular knives in the high position.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

Fig. 1 shows a chop-shearing device 100 at the start of the run-through of the rolling-stock 50 in the free space between the annular knives 25 mounted in a shearing device frame 20. The arrangement of the annular knives is as disclosed in U.S. Patent 3,491,640 (Poran), the entire contents of which is incorporated herein by reference.

In the initial position of the chop-shearing device 100 shown in Fig. 1, a front guide part 10 is in its lower position and the shearing device frame 20 in its basic position. The tip of the rolling-stock 50 runs obliquely downward into the lower of the rear three rear guides 31, 32, 33 and thus arrives at the chop-shearing device. For separating the front crop 51 of the rolling stock 50, the front guide part 10 is pivoted upward as far as a middle position as shown in Fig. 2. Since the annular knives 25 are in this case in their cutting position, separation of the running stock occurs, and the cut-off front crop 51 runs further on through the lower guide 33 of the three rear guides 31, 32, 33. The rolling stock 50, now free of the front crop 51, is guided through the middle guide 32 of the three rear guides 31, 32, 33 horizontally to the winder. During the further run-through of the rolling stock 50, the annular knives 25 are separated or opened and the shearing device frame 20 is moved into a high position as shown in Fig. 3 without cutting the rolling stock 50. Subsequently, the annular knives 25 are brought back to the cutting position in which the cutting edges are against one another.

To separate a rear crop 52, the front guide part 10 pivots into the upper position as shown in Fig. 4. The rear crop 52 is separated from the rolling stock 50 and is led through the upper guide 31 of the rear guide parts 31, 32, 33 to the chop-shearing device 100.

After the front guide part 10 has been pivoted downward and the shearing device 20 moved down into the basic position, the initial position as shown in Fig. 1 is reached again.

Thus, while there have shown and described and pointed out fundamental novel features of the invention as applied to a preferred embodiment thereof, it will be understood
5 that various omissions and substitutions and changes in the form and details of the devices illustrated, and in their operation, may be made by those skilled in the art without departing from the spirit of the invention. For example, it is expressly intended that all combinations of those elements and/or method steps which perform substantially the same function in substantially the same way to achieve the same results are within the scope of the invention.

10 Moreover, it should be recognized that structures and/or elements and/or method steps shown and/or described in connection with any disclosed form or embodiment of the invention may be incorporated in any other disclosed or described or suggested form or embodiment as a general matter of design choice. It is the intention, therefore, to be limited only as indicated by the scope of the claims appended hereto.